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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,652	07/24/2001	Vladimir Segal	30-5004 DIV2	6609

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EXAMINER

WILKINS III, HARRY D

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 03/11/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/912,652	SEGAL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Harry D Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 January 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 37-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other:  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 37 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segal (US 5,513,512) in view of "Normalizing of Steel".

Segal teaches (see col 3, lines 19-34 and 38-55) that equal channel angular extrusion (ECAE) had been applied to cast alloys. Segal goes on to teach that previously there was a problem in that there was no method of determining the final alloy's structure and texture, but that the invention provides a method of plastic deformation (i.e.-ECAE) that obtains various types of structures and textures. Segal teaches (see col 4, lines 30-49) that for a given workpiece, three main directions are selected which determines its orientation during each passage (i.e.-defining a route). Therefore, Segal teaches a method for controlling the texture of a cast material alloy where the method includes providing a cast material, defining an ECAE route for defining predetermined shear planes and crystallographic directions in the alloy, selecting a route and subjecting the alloy to a number of passes through the selected routes.

Segal does not teach that prior to the ECAE, the alloy is treated by one of homogenizing, hot forging and solutionizing.

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"Normalizing of Steel" teaches (see page 35, 1<sup>st</sup>-3<sup>rd</sup> column) that a heat treatment is applied to cast materials in order to ensure a homogeneous texture.

Therefore, it would have been within the expected skill of a routineer in the art to have applied normalizing, as taught by "Normalizing of Steel", to the alloy of Segal before ECAE processing in order to provide a starting material that is as homogeneous as possible. Normalizing is synonymous with homogenizing.

Regarding claim 41, because Segal teaches how to determine the final texture and grain size of the alloy, one of ordinary skill in the art would have expected the process of Segal to inherently possess further steps of ECAE in order to create the desired texture, uniform grain size and texture strength for the alloy.

3. Claims 38, 39, 46-49 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segal (US 5,513,512) in view of "Normalizing of Steel" as applied above to claims 37 and 41, and further in view of "Stress-Relief Heat Treating of Steel".

The teachings of Segal in view of "Normalizing of Steel" are discussed above in paragraph no. 2.

Segal in view of "Normalizing of Steel" do not teach that after the processing step, the alloy is subjected to further processing.

"Stress-Relief Heat Treating of Steel" teaches (see page 33, 1<sup>st</sup> column) that a heat treatment is applied to workpieces that have developed residual stresses in order to relieve the stresses in order to reduce distortion and to prevent stress-corrosion cracking. "Stress-Relief Heat Treating of Steel" teach (see page 33, 2<sup>nd</sup> column) that residual stresses develop during rolling, casting, forging, bending, drawing or

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machining. Therefore, one of ordinary skill in the art would have expected the material of Segal to have residual stresses due to the amount of deformation caused by the ECAE. "Stress-relief treatment" and "recovery annealing" are synonyms.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the stress-relief treatment of "Stress-Relief Heat Treating of Steel" to the material of Segal because the stress-relief treatment reduces distortion and prevents stress-corrosion cracking. Time and temperature were known to be result effective variables (see "Stress-Relief Heat Treating of Steel" at page 33, 3<sup>rd</sup> column), therefore, it would have been obvious to one of ordinary skill in the art to have optimized these process parameters to achieve the proper relief of stresses.

Regarding claim 39, because time and temperature were known to be result effective variables (see "Stress-Relief Heat Treating of Steel" at page 33, 3<sup>rd</sup> column) by means of the "Larson-Miller" equation, it would have been obvious to one of ordinary skill in the art to perform the stress-relief treatment in two steps at different temperatures to achieve the total desired "thermal effect".

Regarding claims 46-49, it would have been obvious to one of ordinary skill in the art to have applied the stress-relief treatment of "Stress-Relief Heat Treating of Steel" to the material of Segal because the stress-relief treatment reduces distortion and prevents stress-corrosion cracking. Time and temperature were known to be result effective variables (see "Stress-Relief Heat Treating of Steel" at page 33, 3<sup>rd</sup> column), therefore, it would have been obvious to one of ordinary skill in the art to have optimized these process parameters to achieve the proper relief of stresses.

Regarding claim 53, it would have been obvious to one of ordinary skill in the art to have applied the stress-relief treatment of "Stress-Relief Heat Treating of Steel" to the final material of Segal because the stress-relief treatment reduces distortion and prevents stress-corrosion cracking. "Stress-relief treatment" and "recovery annealing" are synonyms.

4. Claims 40, 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segal (US 5,513,512) in view of "Stress-Relief Heat Treating of Steel" and Worcester et al (US 5,194,101).

The teachings of Segal are discussed above in paragraph no. 2.

Segal does not teach that the alloy is subjected to intermediate annealing and that after the processing step, the alloy is subjected to further processing.

"Stress-Relief Heat Treating of Steel" teaches (see page 33, 1<sup>st</sup> column) that a heat treatment is applied to workpieces that have developed residual stresses in order to relieve the stresses in order to reduce distortion and to prevent stress-corrosion cracking. "Stress-Relief Heat Treating of Steel" teach (see page 33, 2<sup>nd</sup> column) that residual stresses develop during rolling, casting, forging, bending, drawing or machining. Therefore, one of ordinary skill in the art would have expected the material of Segal to have residual stresses due to the amount of deformation caused by the ECAE. "Stress-relief treatment" and "recovery annealing" are synonyms.

Worcester et al teach (see col. 2, lines 66-68 and claim 1) that stress relief annealing was applied in the metallurgical arts as an intermediate step during a process of several cold deformation steps.

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Therefore, it would have been obvious to one of ordinary skill in the art to have applied an intermediate stress-relief treatment of "Stress-Relief Heat Treating of Steel" as taught by Worcester et al to the material of Segal because the stress-relief treatment reduces stresses that cause brittle fracture during further cold working (for support see page 33, 1<sup>st</sup> column of "Stress-Relief Heat Treating of Steel"). Time and temperature were known to be result effective variables (see "Stress-Relief Heat Treating of Steel" at page 33, 3<sup>rd</sup> column), therefore, it would have been obvious to one of ordinary skill in the art to have optimized these process parameters to achieve the proper relief of stresses. It also would have been obvious to one of ordinary skill in the art to have applied a stress-relief treatment of "Stress-Relief Heat Treating of Steel" after the final extrusion step because the stress-relief treatment reduces distortion and prevents stress-corrosion cracking. The stress-relief treatment is a post-extrusion process that creates the texture, grain size and texture strength of the alloy.

Regarding claims 50 and 51, "stress-relief treatment" and "recovery annealing" are synonyms. Thus, the intermediate and post-extrusion annealing treatments are recovery annealing treatments.

5. Claims 42-45 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segal (US 5,513,512) in view of "Normalizing of Steel" as applied to claims 37 and 41 above, and further in view of "Stress-Relief Heat Treating of Steel" and Worcester et al (US 5,194,101).

The teachings of Segal in view of "Normalizing of Steel" are discussed above in paragraph no. 2.

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Segal in view of "Normalizing of Steel" do not teach applying an intermediate recovery annealing step between at least some of the passes.

"Stress-Relief Heat Treating of Steel" teaches (see page 33, 1<sup>st</sup> column) that a heat treatment is applied to workpieces that have developed residual stresses in order to relieve the stresses in order to reduce distortion and to prevent stress-corrosion cracking. "Stress-Relief Heat Treating of Steel" teach (see page 33, 2<sup>nd</sup> column) that residual stresses develop during rolling, casting, forging, bending, drawing or machining. Therefore, one of ordinary skill in the art would have expected the material of Segal to have residual stresses due to the amount of deformation caused by the ECAE. "Stress-relief treatment" and "recovery annealing" are synonyms.

Worcester et al teach (see col. 2, lines 66-68 and claim 1) that stress relief annealing was applied in the metallurgical arts as an intermediate step during a process of several cold deformation steps.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied an intermediate stress-relief treatment of "Stress-Relief Heat Treating of Steel" as taught by Worcester et al to the material of Segal because the stress-relief treatment reduces stresses that cause brittle fracture during further cold working (for support see page 33, 1<sup>st</sup> column of "Stress-Relief Heat Treating of Steel"). Time and temperature were known to be result effective variables (see "Stress-Relief Heat Treating of Steel" at page 33, 3<sup>rd</sup> column), therefore, it would have been obvious to one of ordinary skill in the art to have optimized these process parameters to achieve the proper relief of stresses.



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Regarding claim 52, it would have been obvious to one of ordinary skill in the art to have applied an intermediate stress-relief treatment of "Stress-Relief Heat Treating of Steel" as taught by Worcester et al to the material of Segal because the stress-relief treatment reduces stresses that cause brittle fracture during further cold working (for support see page 33, 1<sup>st</sup> column of "Stress-Relief Heat Treating of Steel"). "Stress-relief treatment" and "recovery annealing" are synonyms.

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 37-53 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 6:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw  
March 6, 2003

  
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